

# CHEMICAL NOTE ON A RECENT LAVA FROM SAVAII.

BY H. I. JENSEN, B.Sc., LINNEAN MACLEAY FELLOW OF THE  
SOCIETY IN GEOLOGY.

During the course of making some chemical analyses of War-rumbungle Mountains rocks, I also made an analysis of a recent lava, hyalopilitic olivine basalt (S 1) from Malaiola, Savaii, of which a short petrological description appeared in my paper on 'The Geology of Samoa' (These Proceedings, 1906, p.666).

The estimation resulted as follows :—

					%		Mol.
SiO <sub>2</sub>	...	...	...	...	45.96	...	0.766
Al <sub>2</sub> O <sub>3</sub>	...	...	...	...	10.94	...	0.107
Fe <sub>2</sub> O <sub>3</sub>	...	...	...	...	5.85	...	0.036
FeO ...	...	...	...	...	6.39	...	0.089
MnO	...	...	...	...	0.08	...	0.001
NiOCoO	...	...	...	...	0.02	...	—
MgO ...	...	...	...	...	10.82	...	0.271
CaO ...	...	...	...	...	9.96	...	0.179
Na <sub>2</sub> O	...	...	...	...	2.40	...	0.039
K <sub>2</sub> O ...	...	...	...	...	1.92	...	0.020
H <sub>2</sub> O+	...	...	...	...	0.36	}	0.003
H <sub>2</sub> O—	...	...	...	...	0.12		
CO <sub>2</sub> ...	...	...	...	...	abs.		
TiO <sub>2</sub> ...	...	...	...	...	5.50	...	0.069
P <sub>2</sub> O <sub>5</sub>	...	...	...		pres.n.d.in amt.		—
Total					100.32		

The calculation of the norm of this rock resulted as follows:—

Orthoclase	...	...	11·12	} $\frac{\text{Sal.}}{\text{Fem.}} = \frac{44·89}{55·00} = < \frac{5}{3} > \frac{3}{5}$ hence saffemic.
Albite	...	...	20·43	
Anorthite	...	...	13·34	
Diopside	...	...	25·20	} $\frac{\text{Felspar}}{\text{Quartz}} = \frac{44·89}{0} > \frac{7}{1}$ hence Order Gallare.
Olivine	...	...	12·04	
Hæmatite	...	...	2·40	
Magnetite	...	...	4·87	} $\frac{\text{K}_2\text{O} + \text{Na}_2\text{O}}{\text{CaO}} = \frac{59}{179} < \frac{3}{5} > \frac{1}{7}$ hence Docalcic.
Ilmenite	...	...	10·49	
Water	...	...	0·48	
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Total	...	...	100·37	$\frac{\text{K}_2\text{O}}{\text{Na}_2\text{O}} = \frac{20}{39} < \frac{3}{5} > \frac{1}{7}$ Magmatic name: Auvergnase.
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The comparison of the analysis and norm with the petrological description was of some interest.

The analysis bears out my statement that the augite is titaniferous, for the ilmenite actually present in the rock is much below that which we should expect if all the titanium had gone to form ilmenite. My conclusion that the hæmatite present is a primary constituent also follows from the norm. The felspar, however, as calculated from the norm, differs totally from the felspar as observed in the slide.

From the norm we should expect the dominant felspar to be a variety of andesine, but my examination of the rock-slide revealed only basic labradorite or bytownite. This might be accounted for through two circumstances; first, the existence of a glassy residuum which may be very acid in composition; second, the fact that the augite is greenish-brown and highly pleochroic, which phenomena suggest richness in alkali, especially soda.

After the analyses had revealed this disparity between the norm and the mode, as previously obtained, the rock was again examined under the microscope. The description already given in the paper referred to was found to be essentially correct.